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ABSTRACT

Retroactive interference (RI) in prose learning was investigated in an experiment where passages were constructed on the basis of a predetermined logical structure. This structure made it possible to operationally define similarity and assess the effects of RI for inferential information as well as that stated directly in the original passage. Subjects, 40 college students, read the same passage, and half of them were immediately administered a retention test. Subjects then read either a passage highly similar to the first or a completely different passage. Three retention tests were then given to all subjects. A 2x2 design was used to test the effect of similarity and the influence of an immediate test of original learning upon later retention. Overall retention was significantly higher when the original learning test was included, but similarity appeared to affect RI on some measures only in the absence of the test. (Author/MS)

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Retroactive Interference in Prose Learning (Abstract)
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A.E.R.A., February, 1971

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Objective of the inquiry

A number of studies have investigated retroactive interference in prose learning but there has been little agreement in their findings. Two common problems have confronted researchers in this area. One has to do with the distinction between rote and meaningful learning and the other involves developing a means of operationally defining what is meant by similarity between original and interpolated learning tasks. A methodology was tested in this study which attempted to deal with both of these problems.

Methods

This methodology was based upon a system of constructing prose which used Venn diagrams to represent the structure of passages (Dawes, 1964). This type of prose construction had some definite advantages for a study investigating RI: 1) essential information could be held constant for all passages; 2) degree of similarity could be operationally defined by systematically varying the structure of original and interpolated passages; and 3) the logical structure of passages made it possible to write test questions that measured retention of information acquired by making an inference. It was a major concern of this study to determine if RI would operate in the same way for retention of information stated directly as it would for information of an inferential nature. Even if retroactive interference could be shown to operate for information stated directly in a passage in the same way it has been shown to operate in paired-associate studies, it could be said that the RI paradigm is only appropriate for predicting interference when rote learning is involved. For this reason inference-type questions were also used which could be answered only on the basis

of syllogistic reasoning. The correct answer could be obtained only if basic premises dealing with sets and subsets could be recalled. Since the answers to these questions were never stated explicitly in the passage, correct responses were considered to involve something more than rote learning.

Another difficulty of applying the retroactive interference paradigm to prose learning has been that of identifying stimulus and response elements. In this study stimulus and response elements were defined in terms of multiple-choice questions based on the content of the passages. A question stem was considered to be the stimulus and the answer the response. Where the original and interpolated passages were highly similar, the question stems were identical but the correct answers were different. Where the interpolated passage was highly dissimilar both question stems and answers were different.

In addition to the variable of similarity, it was also of interest to determine how giving a retention test after the original learning passage could affect RI. For this reason a test-no test variable was incorporated into a 2x2 factorial design along with two levels of similarity. In the original learning phase all subjects read a passage dealing with anthropology. Half of the subjects were administered a retention test immediately after. Two levels of interpolated learning were used to represent high and low similarity conditions. Subjects in the high similarity condition read another anthropology passage very much like the original in content and logical structure. Those in the low similarity condition read a science fiction passage having completely different content and structure. The interpolated passage in both conditions was presented twice.

Retention of information in the original learning passage was measured by both immediate and delayed tests. Three retention tests were given immediately following interpolated learning: 1) a 15-item multiple-choice test based upon information stated explicitly in the original learning passage; 2) a 15-item multiple-choice test consisting of items that could only be answered by making an inference about original learning; and 3) a test requiring subjects to label the sets and subsets of the original learning Venn diagram. The two multiple-choice tests were administered again after a five week delay. Since this resulted in five dependent measures on each subject the multivariate analysis of variance was used to analyze the data.

Data sources

The sample consisted of 40 students enrolled in a course in educational psychology at Michigan State University. All data were collected during two testing sessions.

Results

Including a retention test as part of the original learning phase had a significant effect upon retention ($p < .001$) according to the overall multivariate test. Step-down tests were found to be significant for measures of directly stated information ($p < .002$) and inferential information ($p < .002$). Similar-dissimilar contrasts were performed for both test and no-test conditions. No effect of RI was found when the original learning test was included. Under the no-test condition two of the step-down tests were significant. Retention of directly stated information was found to be significantly lower ($p < .05$), although this same result was not found when the same test was given five weeks later. Retention as measured by the Venn diagram was significantly higher for the same subjects.

Educational importance

The facilitating effect of providing a test immediately after original learning was discussed in relation to retroactive interference as well as other theoretical notions. Significant findings obtained under the no-test condition were discussed in terms of paired-associate and subjective organization models. Obtaining multiple retention measures on each subject appears to be one way of shedding some light upon the rote-meaningful controversy in prose learning research. This experiment was one example of how multivariate analysis can be used to this end.